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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/199,816	11/25/1998	MASATO SHIMADA	Q52241	4106
7590 08/11/2004				
SUGHRUE, MION, ZINN, MACPEAK & SEAS 2100 PENNSYLVANIA AVENUE NW WASHINGTON, DC 200373202			EXAMINER NGUYEN, LAM S	
			ART UNIT 2853	PAPER NUMBER

DATE MAILED: 08/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/199,816

Applicant(s)

SHIMADA ET AL.

Examiner

LAM S NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2004 and 05 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-67 is/are pending in the application.
- 4a) Of the above claim(s) 4-9, 11-47, 49, 50 and 53-66 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 10, 51-52/1, 51-52/2, 51-52/3, 51-52/10 and 67 is/are rejected.
- 7) ☒ Claim(s) 48, 51-52/48 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

The following new ground rejection is made to show more evidences provided in the cited prior art against the claimed invention in order to support for the rejection made by the previous examiner. No new prior art is applied in the following rejection.

Election/Restrictions

Applicants' election without traverse of claims 1-3, 10, 48, 51-52, and 67 in the response to the Election of Species Requirement filed on 05/17/2004 is acknowledged.

Claims 4-9, 13-19, 22, 24-35, 37, 39, 41, 43-47, 49, 50 and 53-55 have been withdrawn from consideration. Claims 56-63 also had previously been withdrawn.

The election of a group of claims 11-12, 40-43 and a group of claims 20-23, 36, 38, each reads on either Species I of a sub-species is improper because the groups of claims fail to read on the combination of both the species and the sub-species.

Therefore, only claims 1-3, 10, 48, 51-52, and 67 are consideration in the following action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 10, 51-52/1-3, 51-52/10, and 67 are rejected under 35 U.S.C. 102(b) as being anticipated by Hashizumi et al. (EP 786,345).

Regarding claim 1:

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Hashizumi et al. disclose in an ink jet recording head of the type having
a flow passage formation substrate (*FIG. 12, 15, element SI*) in which a pressure generation chamber is formed (*FIG. 12, 15, element IT*), said pressure generation chamber being in communication with a nozzle opening (*FIG. 12, 15, element NH*),

a diaphragm (*FIG. 12, 15, elements BE, VP*) provided on said flow passage formation substrate, said diaphragm defining an interior wall of said pressure generation chamber, and

a piezoelectric element (*FIG. 12, 15, elements UE, PZ, BE*) provided on said diaphragm, said piezoelectric element having at least a lower electrode (*FIG. 12, 15, element BE*), a piezoelectric layer (*FIG. 12, 15, element PZ*), and an upper electrode (*FIG. 12, 15, element UE*), the improvement comprising:

at least one of the group consisting of said diaphragm and said piezoelectric element, includes a compression film having a compressive stress (*column 10, lines 7, 8: The layer VP has a compressive internal stress*), wherein at least a part of a thickness of said compression film is removed in an area opposed to said pressure generation chamber, thereby forming a removal part (*Fig. 15: The portion td2, FIG. 12: The portion ta2, and column 3, lines 5-10: The portion of the diaphragm in the area not attached to the piezoelectric thin film is thinner than the portion of the diaphragm in the area attached to the piezoelectric thin film*).

Regarding to claim 2: wherein the compression film is other than the piezoelectric layer (*FIG. 12, 15: Only either layer BE or VP, not layer PZ, has the compressive stress*).

Regarding to claim 3: wherein the compression film has at least a part in the thickness direction removed only in a portion along margins of the pressure generation chamber on both sides of said piezoelectric element in a width direction thereof (*FIG. 15: The portions ta2, td2*).

Regarding to claim 10: wherein the compression film forms at least a part of an elastic film forming at least a part of the diaphragm (*Fig. 15 and column 10, lines 5-10: The silicon oxide film VP is one of diaphragm materials*).

Regarding to claim 51/1-3, 10: wherein the pressure generation chambers are formed on a silicon monocrystalline substrate by anisotropic etching (*col. 12, lines 40-46 and column 7, line 57 to column 8, line 5*) and the layers of said piezoelectric element are formed by film forming and lithography process (*column 1, line 57 to column 2, line 5*). (*In addition, because these claims are apparatus claims, the limitations that claim the method for forming the pressure generation chambers on the substrate and the layers of the piezoelectric element are considered but not given patentable weight*).

Regarding to claims 52/1-3, 10: An ink jet recorder comprising an ink jet recording head as claimed in claims 1-3, 10, 48 (*column 1, lines 4-10*).

Regarding to claim 67: wherein said compression film includes said compressive stress pre-established therein (*column 10, lines 76-10: The layer VP has a compressive internal (pre-established) stress*).

Allowable Subject Matter

Claims 48, 51-52/48 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The primary reasons for the indication of the allowability of claim 48 is the inclusions therein, in combination as currently claimed, of the limitation that wherein a stress of the piezoelectric layer when a drive force load is imposed on said piezoelectric element is equal to a stress at the piezoelectric layer formation time or is larger in a tension direction is neither disclosed nor taught by the cited prior art of record, alone or in combination.

Claims 51-52/48 are allowable because they depend directly/indirectly on claim 48.

Response to Arguments

Applicant's arguments filed 01/05/2004 have been fully considered but they are not persuasive.

The applicants argued that the layer VP in FIG. 15, even though shows a portion removed in the area of the pressure generation chamber, does not have an internal compression stress. However, as stated on column 16, lines 20-25 that the layer VP in FIG. 15 and the layer VP in FIG. 12 are formed by the same process (FIG. 16-26), made of the same material, silicon oxide, and on the same substrate Si; as a result, they must have the same characteristic properties, inherently. So if the applicants admit that the diaphragm VP in FIG. 12 has an internal compression stress, the layer VP in FIG. 15 must have an internal compression stress too.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN
August 3, 2004

Muel BL
Primary Examiner